محمد شیرانی ۹۹/۵/۳۰

۱- (۲)

$(1,1)\ \begin{cases} 2^{A+B}=1 \\ 2^{2A+B}=9 \end{cases} \Rightarrow \begin{cases} A+B=0 \\ 2A+B=2 \end{cases} \Rightarrow \begin{matrix} A=1 \\ B=-1 \end{matrix}$

$(2,9)$

$\Rightarrow 2^{x-1}=1 \Rightarrow x=0 \Rightarrow 2^{-1}=\frac{1}{2}$ ✓

۲- (۲)

$2^{2x}+12=8\times 2^{x} \xrightarrow{2^x=b} b^2-8b+12=0 \rightarrow \begin{cases} b_1=6 \\ b_2=2 \end{cases}$

$\Rightarrow x_1=\log_2^6$

$\Rightarrow x_2=\log_2^2$

$\Rightarrow x_1+x_2=\log_2^{12}$ ✓

۳- (۲)

$(\log_{21}^3)^2+(1+\log_{21}^7)(3+\log_{21}^3)+(1-\log_{21}^3)$

$=(\log_{21}^3)^2+4-(\log_{21}^3)^2=4$ ✓

۴- (۲)

$\log(x-1)^2+(1-x)^2=2 \quad 10^2=(1-x)^2 \Rightarrow 1-x=10$

$x=-9$ ✓

$\Rightarrow \log_2^9=2$ ✓

۵- (۲)

$(x^2+5x+4)(x-2)=2^3=x^3-8 \Rightarrow 2x^2=x^2-8 \Rightarrow x=2^{\frac{3}{2}}$ ✓

$\Rightarrow \log_{\sqrt{2}}^{2^{\frac{3}{2}}}=\frac{3}{2}\times 3\times \log_2^2=\frac{9}{2}$ ✓

۶- (۲)

$\log(2-x)(2-x)^2=2 \Rightarrow 10^2=(2-x)^2 \Rightarrow 2-x=10 \rightarrow x=-8$ ✓

$\rightarrow \log_{\sqrt{2}}^{8}=2\times 2=4$ ✓

۷- (۲)

$x^2-4=4x \quad x^2-4x-12=0 \rightarrow (x-2)^2-4=0$

$(x-2)=\sqrt{4}$

$\rightarrow \log_4^{\sqrt{4}(x-2)}=\frac{1}{2}$ ✓

۸- (۲)

$\log_{18}^{8}=\frac{2\log_2^2}{\log_2^{18}}=\frac{2\log_2^2}{2+\log_2^3}=\frac{2\times\frac{5}{8}}{2+\frac{5}{8}}=\frac{\frac{15}{8}}{\frac{21}{8}}=\frac{5}{7}$ ✓

۹- (۲)

$\frac{1}{2}\log_2^3=0,8 \rightarrow \log_2^3=1,6 \quad \log_{12}^{9}=\frac{\log_2^9}{\log_2^{12}}=\frac{1+\log_2^3}{2+\log_2^3}=\frac{2,6}{3,6}=\frac{13}{18}$ ✓

۱۰- (۲)

$(a+b)\times\log 2=a \quad b\log 2=a(1-\log 2) \quad \frac{b}{a}=\frac{1-\log 2}{\log 2}=\frac{\log 5}{\log 2}=\log_2^5$

$(\sqrt{2})^{\log_2^5}=5^{\log_{\sqrt{2}}^{\sqrt{2}}}=\sqrt{5}$ ✓